

PATENT COOPERATION TREATY

Due: 9/16/04
RECEIVED
 JUN. 2 1. 2004
 R. MATA

From the
 INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

WRITTEN OPINION (PCT Rule 66)

To:

YASUMURA, Takaaki
 Fifteenth Floor,
 Crystal Tower,
 2-27, Shiromi 1-chome,
 Chuo-ku, Osaka-shi
 Osaka 540-6015
 JAPON

Date of mailing
 (day/month/year) 16.06.2004

Applicant's or agent's file reference
 02R00363/PC

REPLY DUE **within 3 month(s)**
 from the above date of mailing

International application No.
 PCT/JP 03/10421

International filing date (day/month/year)
 18.08.2003

Priority date (day/month/year)
 23.08.2002

International Patent Classification (IPC) or both national classification and IPC
 H01L21/203, H01L21/203

Applicant
 SHARP KABUSHIKI KAISHA et al.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application
3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
 For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
 For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 23.12.2004

Name and mailing address of the international preliminary examining authority:



European Patent Office
 D-80298 Munich
 Tel. +49 89 2399 - 0 Tx: 523656 epmu d
 Fax: +49 89 2399 - 4465

Authorized Officer

Wolff, G

Formalities officer (incl. extension of time limits)

Andreatta, R

Telephone No. +49 89 2399-2231



I. Basis of the opinion

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, Pages

1-29 as originally filed

Claims, Numbers

1-21 as originally filed

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	18-21 no
Inventive step (IS)	Claims	1-21 no
Industrial applicability (IA)	Claims	1-21 yes

2. Citations and explanations**see separate sheet**

SECTION V:

- 0 This written opinion is based on the following documents cited in the search report:

D1: WO-A-02103090

D2: WO-A-0201608

D3: EP-A-1061564

D4: EP-A-1164210

- 1 The subject-matter of device claims 18-21 is defined by method steps (. Thereby the category of the claims is not clear (Article 6 PCT).
- 2 From D2, see in particular page 14, lines 9-14 together with claims 1-17, 60-61 and 65, a method of growing an AlGa_N semiconductor layer structure is known, comprising the step of:

(a) supplying ammonia, gallium and aluminium to a growth chamber thereby to grow a first (Al,Ga)_N layer having a non-zero aluminium mole fraction by MBE over a substrate disposed in the growth chamber.

Thus, the subject-matter of claim 1 differs from the state of the art only in that ammonia is supplied at a beam equivalent pressure of at least 1×10^{-4} hPa, gallium is supplied at a beam equivalent pressure of at least 1×10^{-8} hPa and aluminium is supplied at a beam equivalent pressure of at least 1×10^{-8} hPa.

However, it is a routine measure of the skilled person to determine optimum deposition parameters.

Consequently, the subject-matter of claim 1 is obvious for the person skilled in the art. Claim 1 does therefore not meet the requirement of Article 33(3) PCT.

- 3 Similarly, the subject-matter of claim 1 is also obvious in view of D3 (see in particular the claims and figures 1 and 6) and/or D4 (see in particular paragraphs [0040], [0044] and [0057] and the claims).
- 4 The subject-matter of dependent claims 2-17 is also known or obvious in view of

D2, D3 and/or D4.

- 5 Disregarding the method features in claims 18-21 (see above), the subject-matter of these claims is known in the prior art, see D1-D4.